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AUTHOR Nickens, John
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ABSTRACT

A research project was undertaken to determine: (1) the relationships between scores on the Florida College-Level Academic Skills Test (CLAST) and prior scores on corresponding entry placement tests; (2) the relationships between course completion patterns and performance on CLAST subtests; and (3) the relationships between grades in reading, English, and mathematics and scores on corresponding CLAST subtests. A final sample of 413 students for whom prior data was available was selected from the February 1991 administration of the CLAST. Results indicated that students who passed their placement tests did much better on the CLAST than those who failed initial placement tests, and that the strength of the placement score was related to performance on CLAST subtests. The relationships between course completion patterns and performance on CLAST subtests differed somewhat according to subject area, but in English and mathematics those who had taken several area courses were most likely to be successful on CLAST subtests. There was a strong relationship between students' grade point averages, and their CLAST performance. Three appendixes present 24 detailed tables and 10 figures. (SLD)

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ED 390 883

Research Studies Related to the College-Level Academic Skills Test

Dr. John Nickens

University of Florida
College of Education
Gainesville, Florida
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Introduction

In May 1991, the Florida Department of Education issued grant #011-9307-91004 to the University of Florida, College of Education for the purpose of conducting certain research studies related to the College-Level Academic Skills Test (CLAST). The research was conducted by Dr. John Nickens in cooperation with staff of the Student Assessment Services Section of the Division of Public Schools. These studies were prompted by the interest of members of the State Board of Education in better understanding CLAST and what may be contributing to the observed patterns of examinee performance.

Research Questions

The following research questions guided this research project:

1. What are the relationships between performance on the CLAST subtests and prior scores on corresponding entry placement tests?

2. What are the relationships between course completion patterns and subsequent performance on corresponding CLAST subtests?

3. What are the relationships between grades earned in reading, English, and mathematics courses and scores on corresponding CLAST subtests?

Methodology

A sample of 722 students from across the state were randomly selected from the February 1991 administration of CLAST. The sample included only those students who took CLAST for the first time. Based upon an examination of their transcripts, students who had transferred from one institution to another prior to taking CLAST were excluded from the sample. This was done because such transfer could mask institutional effects in the studies as well as distort the number of credits earned in the CLAST subject areas. This adjustment resulted in a final sample of 413 cases with usable data.

The study was designed to select test-takers and to track them backward in time to their earlier performance on placement tests, rather than to select entering students and track forward. This design not only permitted the study to move forward quickly with available data, but avoided the need to select a large sample to compensate for the ordinary dropout rate in postsecondary institutions. By projecting backward in time, beginning with the CLAST data set, it was possible to obtain more complete data for the subjects in the sample.

The sample was selected from the CLAST data set and listed students by institution, by name, and by social security number. The representativeness of the sample may be estimated from inspection of the following data. As can be seen from these data, the sample is close to the population parameters although the mathematics performance of the study sample is slightly lower than that of the population.

	% White	% Black	% Hispanic	% Other
Feb. 1991 population	74.9	9.2	10.2	3.1
Study sample	73.8	10.9	12.3	2.9

	% Passing Essay	% Passing English	% Passing Reading	% Passing Math
Feb. 1991 population	93	79	77	80
Study sample	93.2	77.8	77.1	75.1

The sample was forwarded to the Department of Education to obtain transcripts for each individual in the sample. A format was developed to record data from the student transcripts. Each name and social security number, by institution, was listed opposite fields for recording the number of credits for each type course taken and grade point average. Also, a list of relevant courses for each CLAST subtest area was developed by examining the Common Course Numbering System. This list was created with the cooperation of Pat Grunder, Director of Institutional Research, Santa Fe Community College.

The Division of Community Colleges provided a data tape of placement test scores through 1990. Transcripts were inspected to provide information which was missing from the data tape. The sample was matched by social security numbers to the CLAST data tape, and records were imported to the sample data base.

For transcripts with missing placement test scores (approximately 30% of the sample), the pass or fail category was inferred from a review of college preparation courses taken.

Because institutions use a variety of placement tests, it was desirable to convert the test scores to a common scale To do this, score concordance tables were obtained from Dr. Martha Miller, Educational Policy Office, Department of Education. The placement test scores then were converted to the score scale of the American College Test (ACT). It should be noted that this concordance is not without its technical difficulties, and therefore, the analyses of placement data should be considered with caution. Analyses based on pass/fail classifications, however, may be viewed as more accurate.

There was considerable variation among the postsecondary institutions in the percentage of students who passed each CLAST subtest. This variation might be partially attributable to differing policies within the institutions relative to the kind

of preparation students are given prior to taking CLAST. Some institutions require students to take special preparation courses or courses in addition to the current state requirement of 18 semester hours prior to CLAST or to pass a locally constructed CLAST-parallel test. A telephone survey was conducted to determine the extent to which such pre-CLAST requirements vary among institutions. However, the results were inconclusive, and this analysis was not pursued further.

Once the data set for the project was established, various analyses were conducted. Tables and graphs were constructed to display the data. These included:

1. Comparisons of pass, pass-fail, and fail rates on the corresponding placement tests and CLAST subtests;

2. Correlations between variables; and

3. Comparisons of number of courses completed and the passing/failing rates on each corresponding CLAST subtest.

The analyses were prepared through software packages for use on microcomputers including the Statistical Programs for Social Sciences (SPSS), Harvard Graphics, and SYSTAT.

Results

Appendix A contains a listing of the variables collected in this study, a definition of each, and, as Table 1A, a listing of the average value for each variable, its standard deviation, and the number of available cases. For most of the variables, there were 410 cases available, but for others fewer cases were available. In analyzing examinee performance on the placement tests in terms of actual scores as opposed to simply pass/fail classification, only examinees with complete test data were used. The number of cases, means, and standard deviations for this reduced data set is shown in Appendix B, Table 1B. The analysis of each of the three research questions is discussed in the following pages. The data are found in Appendix C.

Question 1: What are the relationships between performance on the CLAST subtests and prior scores on corresponding entry placement tests?

The pass/fail results on placement tests are compared to the pass/fail results of the corresponding CLAST subtests in Tables 2 through 5. In viewing these and other tables in this report it is important to note that numerous interventions are expected to have influenced CLAST scores between the time the placement test is taken and the time of CLAST. One such factor is the completion of courses with content related to CLAST areas (discussed in later sections of this report).

Table 2 compares the CLAST reading subtest pass/fail results with the entry placement reading pass/fail results. The table shows that of the 410 cases in the sample, 77.1% passed CLAST reading. Only 7.6% of this group had failed entry placement in reading. However, 24.5% of the students who failed CLAST reading had failed the reading placement test. Thus, the CLAST reading failure rate was more than three times as high for the cases that had failed placement reading than for those that had passed.

Table 3 shows a comparison between results on the CLAST writing subtest results (i.e., English Language Skills) and placement test results in writing. The table shows

that of the 319 cases who passed CLAST writing, 10.7% had failed their placement test in writing. But, of the 91 cases who failed CLAST writing, 38.5% had also failed placement writing. Thus, students who failed the placement test were over three times more likely to fail the CLAST writing test.

Table 4 shows a comparison between results on the CLAST mathematics subtest and the mathematics placement test. As seen in the table, the failure rate on CLAST computations was 78.4% for cases that had failed placement computations and 40.3% for those that had passed. Students who fail the mathematics placement test, then, are twice as likely to fail the CLAST mathematics test.

Table 5 shows the relationship between the CLAST essay subtest and entry placement in writing. The table shows that the writing placement failure rate was 39.3% for the cases who failed the CLAST essay and 15.2% for students who had passed writing placement.

In general, these data indicate a clear relationship between entry placement test failure and subsequent CLAST failure. Some students who fail the placement test do, indeed, go on to earn passing scores on CLAST. However, the performance patterns indicate that those who fail their placement test are likely to fail the corresponding CLAST test. Many students who enter college with academic skill deficiencies still have the deficiencies when they take the CLAST. These data are even more striking when one realizes that this sample was drawn from cases who had persisted from entry placement through the taking of the CLAST. Many students, estimated to be in excess of 50%, drop out between placement and CLAST testing.

Tables 6 and 7 compare placement test results with CLAST results for each CLAST subtest by race. Figures 1 through 4 provide a graphic representation of the relationships presented in these tables. Students other than black, Hispanic and white were categorized under "other" because of small numbers.

Each of these figures represents students who passed the particular CLAST subtests. The bars on the left side of the figure represent cases that failed the placement test and the bars on the right represent cases that passed. The height of the bars represents the percentage of each group that passed the particular CLAST subtest.

It can be seen from Figure 1 that a higher percentage of students in each group who passed their reading placement test also passed CLAST reading, compared to those in the group who failed their placement tests. This relationship was strongest for the white group where only 56.5% who failed placement reading passed CLAST reading, compared to 84% who passed CLAST reading after also passing placement reading. The Hispanic group shows a similar pattern, but with the lower percentages of 50% and 75.7%, respectively. The passing of placement reading made little difference for black students. The "other" group had only 11 cases, which is too small for meaningful comparisons.

Figure 2 presents the results for writing. This figure shows that students who passed entry writing passed CLAST writing at rates of more than 85%, with the exception of the rate for black minority students (54.5% passing). As in reading, passing placement writing made less difference in passing CLAST writing for Black students than for students of other groups. Again, with only twelve students classified as "other," the data must be interpreted with caution.

Figure 3 presents the results for mathematics . The most noticeable pattern is, again, for black students, where the passing rate on the CLAST mathematics test is the same regardless of whether the students initially passed or failed the placement test.

The data pattern for black examinees seen in the previous three figures is not repeated in Figure 4, the CLAST essay results. In this case, black students who had passed the placement test did score significantly better than did those who had failed this placement test.

These results may be due to the writing placement test cut-scores being set so low as to be below the point on the distribution where accurate predictions can be made about later CLAST performance. Or, it may be that student scores only slightly below the cut-scores on the placement test are not useful in predicting CLAST performance. In the case of the CLAST essay, Figure 4 suggests that there is only a weak relationship between placement writing and CLAST essay performance for any group of examinees. That is, large numbers of students fail the placement yet still pass the CLAST essay. Perhaps either the remediation programs are successful or the two tests measure different achievement factors.

Tables 8 through 11 provide an analysis of the placement test scores in terms of the percentages of failing and passing students on each CLAST subtest. Figures 5 through 8 show graphs of the data on these tables. In each table and corresponding graph, the placement test score has been converted to its nearest estimated ACT test score. These relationships should be considered with caution since the concordance among different tests is not perfect, and the data set is limited in size. Nevertheless, patterns of performance can be seen.

It can be observed from Figure 5 that the relationship of equivalent ACT reading scores to passing CLAST reading is generally linear, with the point corresponding to the score of 12 distorting the line. From Table 8 it can be seen that this distortion was caused by only three cases. The data presenting this distortion was verified from both the transcripts and data tape sources to rule out error as a cause.

If the single score aberration is ignored, the plot of percentages passed vs. test scores in reading shows a strong relationship to entry placement reading scores. This relation is characterized by a steep decline in the percentage passing the CLAST reading subtest in the set of scores below 16, and very few students failing the CLAST with placement scores above 22.

Figure 6 shows the graph of equivalent ACT writing scores and percentages of cases passing CLAST writing. It can be observed here that the score of 8 (due to the performance of two students) causes a deviation from an otherwise smooth curve. This graph is similar to that for reading in that the curve is steepest near the bottom of the score distribution and flattens out above the placement pass/fail cut-score threshold. Below an ACT equivalent score of 14, the performance of students drops significantly.

Figure 7 shows the relationship of equivalent ACT mathematics scores to passing the CLAST mathematics subtest. It is evident from the trend of the line that a strong relationship exists between the two tests, although here again is a single score aberration at the lowest end of the distribution. A smooth curve drawn through these data points would suggest that placement scores below 18 are related to later failure on the CLAST mathematics subtest. As for the single score aberration, this particular student evidently took and passed a college algebra course and

subsequently passed the CLAST mathematics subtest. It is likely that the placement test score in mathematics was an inaccurate measure of this student's skill.

Figure 8 is a plot of equivalent ACT writing scores as they relate to the percentage of students passing the CLAST essay. It can be seen that this curve is quite different from the other curves in that much higher percentages of the cases passed the CLAST essay throughout the range of placement scores and that the slope of the graph is less steep. Actually, almost all cases passing the placement writing test passed the CLAST essay. Since it is likely that the writing placement test and the CLAST essay are measuring two different performance skills, the placement score is not truly indicative of later CLAST performance. In effect, there is almost no writing placement score that indicates poor performance later on the CLAST essay.

Finally, Table 12 shows the Pearson correlations between equivalent ACT entry placement test scores and CLAST scores. It can be seen that the correlations between placement reading, writing, and mathematics with the CLAST subtests in corresponding areas were all above 0.60 and significant above the 0.01 level. The writing placement score correlated 0.47 with CLAST essay and was also significant above the 0.01 level. These are strong correlations between achievement tests of this nature. The correlations suggest that students who had initial academic weaknesses had similar weaknesses later when they took the CLAST and vice versa.

To summarize the data found in the previous tables and figures, there apparently is a strong relationship between entry placement test performance and later CLAST performance in all areas, although the relationship is somewhat tenuous for the CLAST essay. However, these relationships must be interpreted with caution because it is not clear exactly when students took the CLAST test or which preparation courses they had before taking CLAST. A more rigorous study would have to be undertaken to establish these relationships more definitively.

Finally, although it must be remembered that the sample size is small, it seems clear that an ACT equivalent score of about 18 for a subject area is necessary to substantially guarantee that first-time examinees will pass the corresponding CLAST subtest. However, because many students come to college with deficits that can be alleviated through developmental courses, and since performance on CLAST subtests improves as students retake subtests initially failed, it probably is not necessary to think in terms of establishing a placement test requirement which is that severe.

Question 2: What are the relationships between course completion patterns and subsequent performance on corresponding CLAST subtests?

Tables 13 through 16 show cross-tabulations between the numbers of college-level courses completed in each CLAST subtest area and the pass/fail status for each CLAST subtest. The courses were identified from transcripts current at the time the CLAST was taken.

Table 13 compares the number of college-level reading courses taken with CLAST reading results. The most striking indication here is that most examinees took no reading courses. It can be observed that 80.4% of the examinees took no course in reading; almost 17% took one course, and 2.9% took two courses. These results demonstrate that few students actually need courses in reading to pass the CLAST reading subtest.

Of the students who took no college-level reading courses, the CLAST reading pass rate was 77.6%. Of the group who took one course, the pass rate was 76.5%. Of the group who took two courses, the pass rate was only 66.7%, although this particular figure is based on only twelve people and must be viewed with caution. Thus, after allowing for the small number of students taking two courses, the data essentially say that the passing rate on the CLAST reading test is about the same regardless of the number of reading courses taken.

Table 14 shows the numbers of college-level English courses taken and the corresponding pass/fail result in CLAST writing. It can be seen that most students (about 78%) took two or more English courses; 16.8% took only one course; and 5.6% took no English course. These data suggest that the majority of students did not take the CLAST until they had completed either two or three English courses. Their performance was then quite good, as 245 of the 319 students passed (77%).

Table 15 shows the numbers of college-level mathematics courses taken and the corresponding pass/fail in CLAST mathematics . Unlike with writing, the number of CLAST mathematics failures decreases as the number of courses increases . The corresponding failure rate for no courses taken was 43.1%, for one course 15.3%, for two courses 12.9%, and for three courses only 5.2%. This pattern suggests that students taking more mathematics courses are better prepared to pass the CLAST mathematics subtest. Interestingly, inspection of the transcripts indicates that the grade point averages in mathematics courses declined as the number of courses increased, indicating that many students were unable to perform well in the more advanced courses.

Table 16 compares the number of college-level English courses completed with CLAST essay results. It can be observed that of the 5.6% of cases took no English course prior to taking CLAST, the failure rate for the essay was only 13%. The failure rate for students taking one or two English courses was still lower (5.8% and 5.5%, respectively). However, the failure rate was higher (14.9%) for students taking three courses than for students taking no courses. These data are almost identical to those seen in Table 14 in terms of the number of students taking zero, one, two, or three courses, except that the percentages passing and failing the corresponding CLAST test vary.

The data in Table 16 suggest that most students have taken two English courses at the time they take the CLAST essay. However, the passing rates do not vary substantially regardless of how many English courses have been taken.

Figure 9 presents a comparison of CLAST subtest failures showing the percentage of students taking 0 - 3 courses related to each area. The figure shows that reading has by far the highest percentages of failures (above 75%) for persons taking no courses, with mathematics ranking next with 25%. CLAST writing and essay subtests show comparatively small percentages of failures among students taking no courses.

Tables 17 through 20 show relationships of college preparation courses taken to corresponding CLAST subtest results. In viewing these tables one should be aware that the reason a student takes college preparation courses instead of college level courses is academic skills deficiency, as measured by the entry placement test. Therefore, students taking few college preparation courses possibly come with better academic skills than those taking more such courses or that one course was not sufficient to overcome the deficit.

Table 17 shows the percentages of cases passing and failing the CLAST reading subtest for each number of developmental reading courses taken. Seventy-four students who had not taken any developmental courses in reading failed the CLAST reading test. Of the 38 students who had taken one developmental course, some 47.4% still failed CLAST reading. This may indicate that the course was not rigorous enough to guarantee that the student would be successful later when taking the CLAST reading test.

Table 18 shows the course-taking patterns for students taking English developmental courses and their CLAST writing results. Most students took no developmental English courses, yet most (83%) passed the CLAST writing test. Of 23 students who took one developmental course and four students who took two such courses, 20 (74%) still failed CLAST writing. Clearly, the preparation courses did not correct the writing deficiencies detected by the placement tests for these students.

Table 19 compares the percentages of cases failing and passing the CLAST mathematics subtest with the number of college preparation mathematics courses completed. It can be seen from this table that 88.3% of the cases with no developmental mathematics course passed the CLAST mathematics subtest, while all with one or more developmental courses failed. Evidently, the mathematics deficiencies detected by the placement exam were still present at the time the students took the CLAST, despite their completion of one or more developmental mathematics courses.

Table 20 relates results of the CLAST essay subtest to the number of college preparation courses completed in English. Of 33 students who had taken one or more preparation courses, 21 passed the CLAST essay. Students who took no developmental courses passed the CLAST at a rate of 95.8%. These students presumably were determined by their placement test results to be ready for college-level courses, but there is the possibility that some may simply have not taken a developmental course prior to initially taking CLAST.

Figure 10 presents the percentages of the examinees who failed a designated CLAST subtest in terms of the number of developmental courses they took in each area. This figure is simply a graphic portrayal of the data shown in Tables 17 - 20.

Question 3: What are the relationships between grades earned in reading, English, and mathematics courses and scores on corresponding CLAST subtests?

Table 21 shows the correlations between the CLAST subtest scores and numbers of college-level courses taken in subtest areas and grade point averages. It can be seen that the correlations are modest, at less than about 0.36 in all cases. These low correlations are consistent with the figures and tables previously presented Apparently, the strongest positive correlation is in the area of mathematics where the number of courses taken clearly relates to ability to pass the CLAST mathematics test. In all other areas, this relationship is barely discernible if not actually negative.

Grades earned (GPA), on the other hand, are positively linked to the ability to pass the CLAST subtests, although the correlations are modest. In this case, the strongest correlation is between the English coursework GPA and the ability to pass the CLAST writing test (i.e., English Language Skills).

The relationship between grades earned and the pass/fail status on each CLAST subtest is further displayed in Tables 22 through 24. Table 22 shows the

performance of students on the CLAST writing test compared to their English GPA. The increasing relationship is clear in that students with a GPA of less than 2.00 have only a 50-50 chance of passing the test compared to students with a GPA of 4.00, who pass the writing test at a 92.9% rate.

Table 23 shows the same type of data for the English GPA and the CLAST essay results. Students whose English GPA is less than 2.00 pass the CLAST essay at the rate of 72.7% The rate steadily increases as the GPA increases. The pattern drifts a bit at the highest level, but this is considered to be a statistical sampling error.

Table 24 displays the same type of information for the mathematics area. Here, the data are not as clear cut. Students who earned a GPA of 3.50 and higher pass CLAST mathematics at a solid, impressive rate (90.5% and 82%, respectively). However, students with lower GPAs also pass CLAST at fairly good rates, ranging from 71.1% to 81.3%.

Discussion

The purpose of this study was to answer three research questions. Data were collected on a sample of students for whom complete test score information and transcripts were available.

The first research question was, "What are the relationships between performance on the CLAST subtests and prior scores on corresponding entry placement tests?" Results presented in figures and diagrams in this study support the conclusion that students who pass their placement tests do much better on the CLAST subtests than students who initially fail the placement tests. However, the strength of this relationship varies somewhat from area to area, with that of placement writing to the CLAST essay the weakest.

The data also demonstrate that the strength of the placement score is related to performance on the CLAST subtests. To achieve a passing rate (first-time) of about 80% on each CLAST subtest, the ACT equivalent cut-score on the placement test should be about 18, much higher than the present levels.

Finally, correlations between the placement test performance and the corresponding CLAST subtest scores are quite strong. This indicates that students with poor scores on the early placement tests are likely to perform relatively poorly on CLAST.

The second research question was, "What are the relationships between course completion patterns and subsequent performance on corresponding CLAST subtests?" The results reported here reveal patterns that are somewhat different depending on the subject area. In the area of reading, most students took no reading course, yet passed the CLAST reading test. Students who failed the placement reading test and subsequently took developmental reading courses still did not pass the CLAST reading test, suggesting that their deficits are quite severe. In the area of English, the data revealed that students who were successful on the CLAST English Language Skills and essay subtests had taken two or three English courses. In mathematics, the data show that students who take several mathematics courses are more likely to be successful on the CLAST mathematics test than those who do not.

The third research question was, "What are the relationships between grades earned in reading, English, and mathematics courses and scores on corresponding CLAST subtests?" Although there are some differences between the score patterns from area to area, it is clear from the data that there is a strong relationship between students' grade point averages and their CLAST performance. As one might expect, students with a low GPA perform at lower levels on CLAST than those with better GPAs. However, even students with modest GPAs were able to pass the individual CLAST subtests on the initial attempt at rates above 75%.

There are limitations to the conclusions reached through this study. The sample size is too small to elicit confidence in certain generalizations about subgroup performance (e.g., Hispanic students). The concordance among different placement tests is not an exact translation. Some analyses were performed on smaller data sets. These factors notwithstanding, the study is still useful in understanding the relationships among the variables of interest.

Additionally, one must approach the interpretation of the data with caution because many intervening factors are not considered within the data analyses. For example, students may take CLAST at any time; there is no restriction that prevents students from taking CLAST before they are ready academically. This can lead to depressed scores. It is not known why students selected the particular courses they took. Perhaps some students were avoiding a given class (e.g., a higher level mathematics course) or were attracted to a particular course because of the teacher's skill or reputation or particular course requirements. Also, it is not known how effective any given course was in preparing students for the CLAST subtest in that subject area. Depending on how it is taught, an English course may or may not assist a student in passing the CLAST essay.

Last, the study cannot capture what may be the most important factors of all -- student enthusiasm and persistence, both of which make a world of difference in an academic setting. Apparently more than 50% of developmental students drop out of college without taking the CLAST. Thus, while the developmental courses may encourage marginal students to persist in school for the short term, too often they fail to correct the academic deficiencies that placed the student in the developmental course in the first place. Understanding how such factors affect CLAST performance must be left to future research efforts.

APPENDIX A

TABLE 1A

Descriptive Statistics for Study Variables

Variable	Mean	Std Dev.	Minimum	Maximum	N
CPR	.77	.42	0	1	410
CPW	.78	.42	0	1	410
CPC	.75	.43	0	1	410
CPE	.93	.25	0	1	410
COMSS	310.37	27.43	229	400	410
REASS	313.02	24.31	246	405	410
WRISS	317.61	28.67	220	390	410
ESSTS	4.97	1.32	2	8	410
RS	131.96	209.31	0	680	410
WS	23.09	21.03	0	60	410
MS	182.10	229.48	0	780	410
EPR	.89	.32	0	1	410
EPW	.83	.37	0	1	410
EPC	.50	.50	0	1	410
ERS	20.47	5.73	6	31	170
EWS	18.84	4.77	7	28	156
EMS	20.00	8.06	1	36	161
EP	.12	.50	0	4	410
EP_GPA	1.68	1.51	0	4.00	33
E	1.88	.74	0	3.0	410
E_GPA	2.85	.71	0	4.00	387
CP	.22	.60	0	4	410
CP_GPA	2.01	1.47	0	4.00	61
C	1.69	1.02	0	3.0	410
C_GPA	2.55	1.00	0	4.00	352
RP	.11	.36	0	3	410
RP_GPA	1.82	1.71	0	4.00	42
R	.22	.48	0	2	410
R_GPA	3.01	.82	0	4.00	80

Study Variables and Definitions

1.	CPR	CLAST Pass/Fail status for Reading; 1 = PASS, 0 = FAIL
2.	CPW	Same for writing.
3.	CPC	Same for Computations.
4.	CPE	Same for Essay.
5.	COMSS	CLAST Computation standard score.
6.	REASS	Same for reading.
7.	WRISS	Same for writing (i.e., English Language Skills).
8.	ESSTS	Same for essay.
9.	TEST	Name of placement test (ACT, SAT, MAP, CPT, ASSET)
10.	RS	Reading placement test score
11.	WS	Writing placement test score
12.	MS	Mathematics placement test score
13.	EQUIV	Not used.
14.	EPR	Reading placement test status, 1 = PASS and 0 = FAIL, as determined by Rule 6A-10.0315, FAC.
15.	EPW	Same for writing.
16.	EPC	Same for mathematics.
17.	ERS	ACT equivalent to the available reading placement score.
18.	EWS	Same for writing.
19.	EMS	Same for mathematics.
20.	EP	Number of English college preparation courses completed.
21.	EP_GPA	Grade point average in the English college preparation courses completed.
22.	E	Number of English college level courses completed.
23.	E_GPA	Grade point average in the English college level courses completed.
24.	CP	Number of computations (i.e., mathematics) college preparation courses completed.
25.	CP_GPA	Grade point average in the computations college preparation courses completed.
26.	C	Number of computations college level courses completed.
27.	C_GPA	Grade point average in the computations college level courses completed.
28.	RP	Number of reading college preparation courses completed.
29.	RP_GPA	Grade point average in the reading college preparation courses completed.
30.	R	Number of reading college level courses completed.
31.	R_GPA	Grade point average in the reading college level courses completed.

Missing values are coded -1 for GPA variables.

APPENDIX B

TABLE 1B

Variables Used in Test Score Analyses

ACT Equivalent Test Score	Count	Mean	Standard Deviation
Reading	170	20.47	5.73
Writing	156	18.84	4.77
Mathematics	161	20.00	8.06
CLAST reading	172	314.52	24.66
CLAST writing (Eng. Lang. Skills)	172	320.42	31.62
CLAST essay	172	4.99	1.32
CLAST mathematics	172	313.13	27.25

APPENDIX C

ANALYSES OF DATA

TABLE 2

CLAST Reading Results Compared to Placement Reading Results

Count / Row Pct / Col Pct / Tot Pct	CLAST READING % FAIL	CLAST READING % PASS	Row Total
PLACEMENT READING FAIL	23	24	47
	48.9	51.1	11.5
	24.5	7.6	
	5.6	5.9	
PASS	71	292	363
	19.6	80.4	88.5
	75.5	92.4	
	17.3	71.2	
Column Total	94	316	410
	22.9	77.1	100.0

Number of Missing Observations: 0

TABLE 3

CLAST Writing Results Compared to Placement Writing Results

Count / Row Pct / Col Pct / Tot Pct	CLAST WRITING % FAIL	CLAST WRITING % PASS	Row Total
PLACEMENT WRITING FAIL	35	34	69
	50.7	49.3	16.8
	38.5	10.7	
	8.5	8.3	
PASS	56	285	341
	16.4	83.6	83.2
	61.5	89.3	
	13.7	69.5	
Column Total	91	319	410
	22.2	77.8	100.0

Number of Missing Observations: 0

TABLE 4

CLAST Mathematics Results Compared to Placement Mathematics Results

Count / Row Pct / Col Pct / Tot Pct	CLAST MATHEMATICS % FAIL	CLAST MATHEMATICS % PASS	Row Total
PLACEMENT MATH FAIL	80	124	204
	39.2	60.8	49.8
	78.4	40.3	
	19.5	30.2	
PASS	22	184	206
	10.7	89.3	50.2
	21.6	59.7	
	5.4	44.9	
Column Total	102	308	410
	24.9	75.1	100.0

Number of Missing Observations: 0

TABLE 5

CLAST Essay Results Compared to Placement Writing Results

Count / Row Pct / Col Pct / Tot Pct	CLAST ESSAY % FAIL	CLAST ESSAY % PASS	Row Total
PLACEMENT WRITING FAIL	11	58	69
	15.9	84.1	16.8
	39.3	15.2	
	2.7	14.1	
PASS	17	324	341
	5.0	95.0	83.2
	60.7	84.8	
	4.1	79.0	
Column Total	28	382	410
	6.8	93.2	100.0

Number of Missing Observations: 0

TABLE 6

CLAST Results by Race Compared to Placement Results

	READING			WRITING		
	CLAST			CLAST		
	% FAIL	% PASS	N	% FAIL	% PASS	N
WHITE (N=305)						
EP FAIL	43.5	56.5	23	41.9	58.1	43
EP PASS	16.0	84.0	282	14.1	85.9	262
BLACK (N=45)						
EP FAIL	60.0	40.0	10	66.7	33.3	12
EP PASS	51.4	48.6	35	45.5	54.5	33
HISPANIC (N=51)						
EP FAIL	50.0	50.0	14	76.9	23.1	13
EP PASS	24.3	75.7	37	10.5	89.5	38
OTHER (N=12)						
EP FAIL	100.0		1	33.3	66.7	3
EP PASS	9.1	90.9	11	11.1	88.9	9

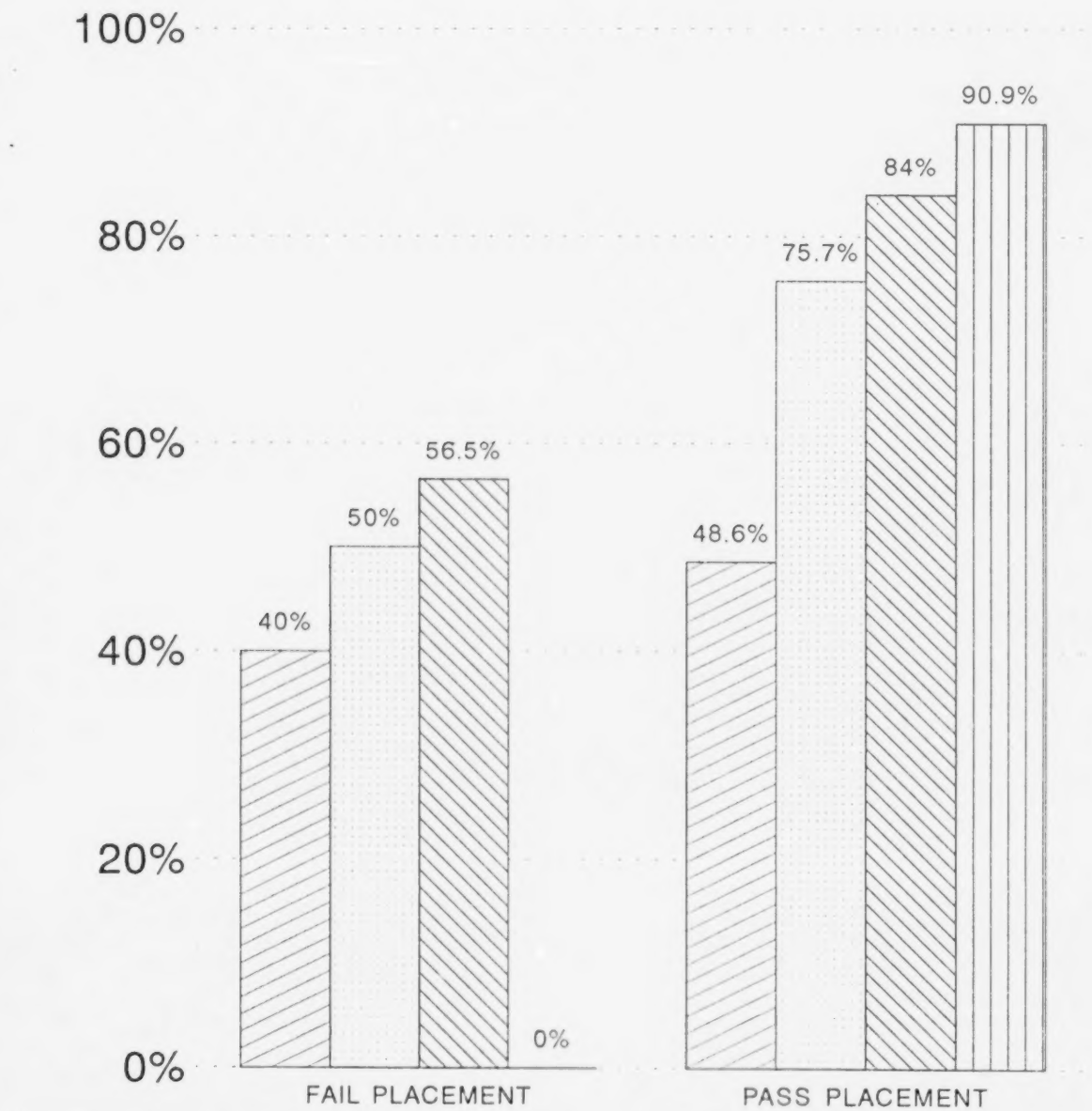
TABLE 7

CLAST Results by Race Compared to Placement Results

	MATHEMATICS			ESSAY		
	CLAST			CLAST		
	% FAIL	% PASS	N	% FAIL	% PASS	N
WHITE (N=305)						
EP FAIL	16.1	83.9	149	7.0	93.0	43
EP PASS	7.7	92.3	156	3.8	96.2	262
BLACK (N=45)						
EP FAIL	42.4	57.6	33	33.3	66.7	12
EP PASS	41.7	58.3	12	15.2	84.8	33
HISPANIC (N=51)						
EP FAIL	29.4	70.6	17	38.5	61.5	13
EP PASS	14.7	85.3	34	10.5	89.5	38
OTHER (N=12)						
EP FAIL		100.0	4		1.00	3
EP PASS		100.0	8		1.00	9

Figure 1

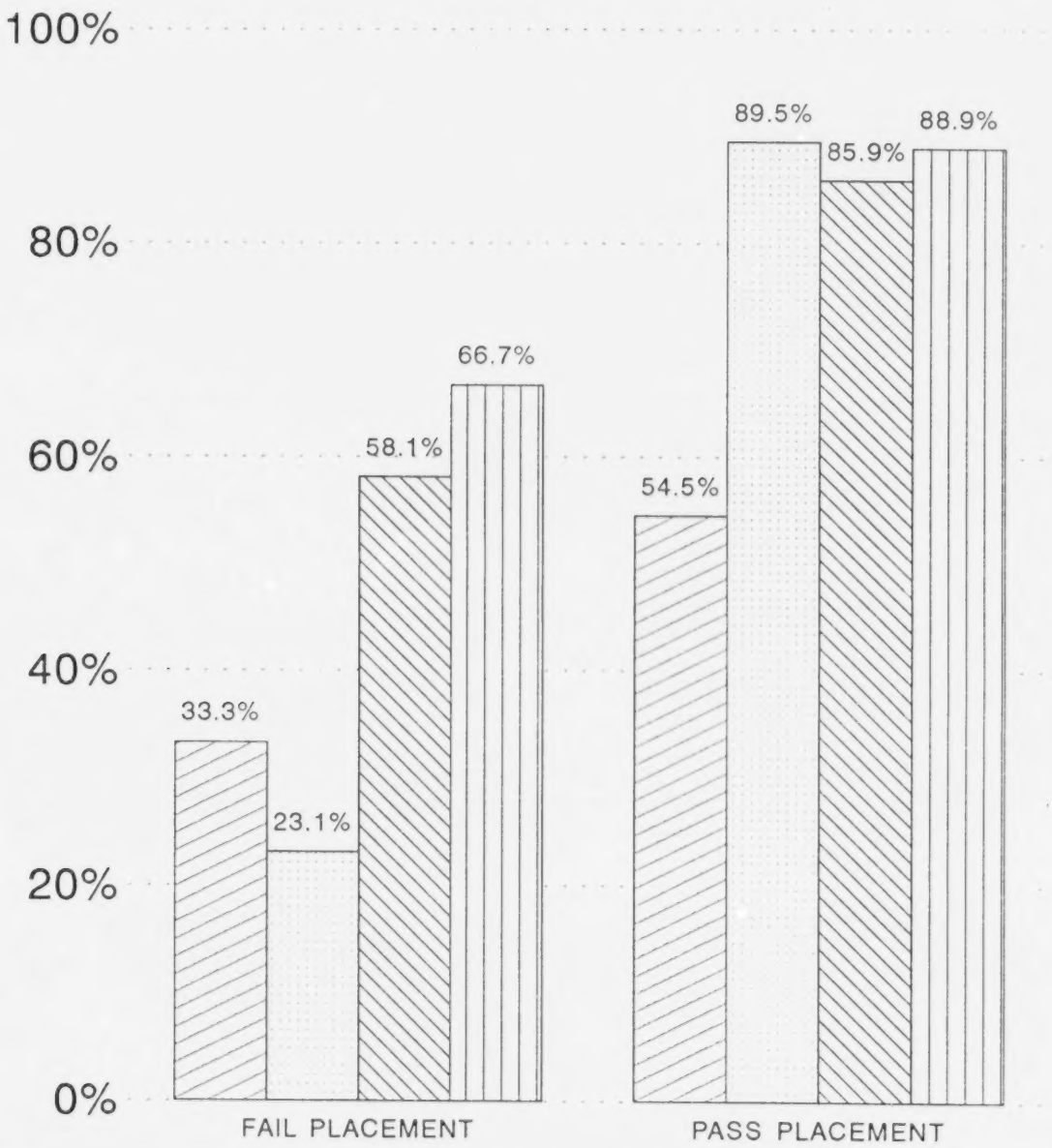
RELATIONSHIP OF PLACEMENT RESULTS IN READING AND PERCENTAGES PASSING CLAST READING BY RACE



BLACK	40%	48.6%
HISPANIC	50%	75.7%
WHITE	56.5%	84%
OTHER	0%	90.9%

Figure 2

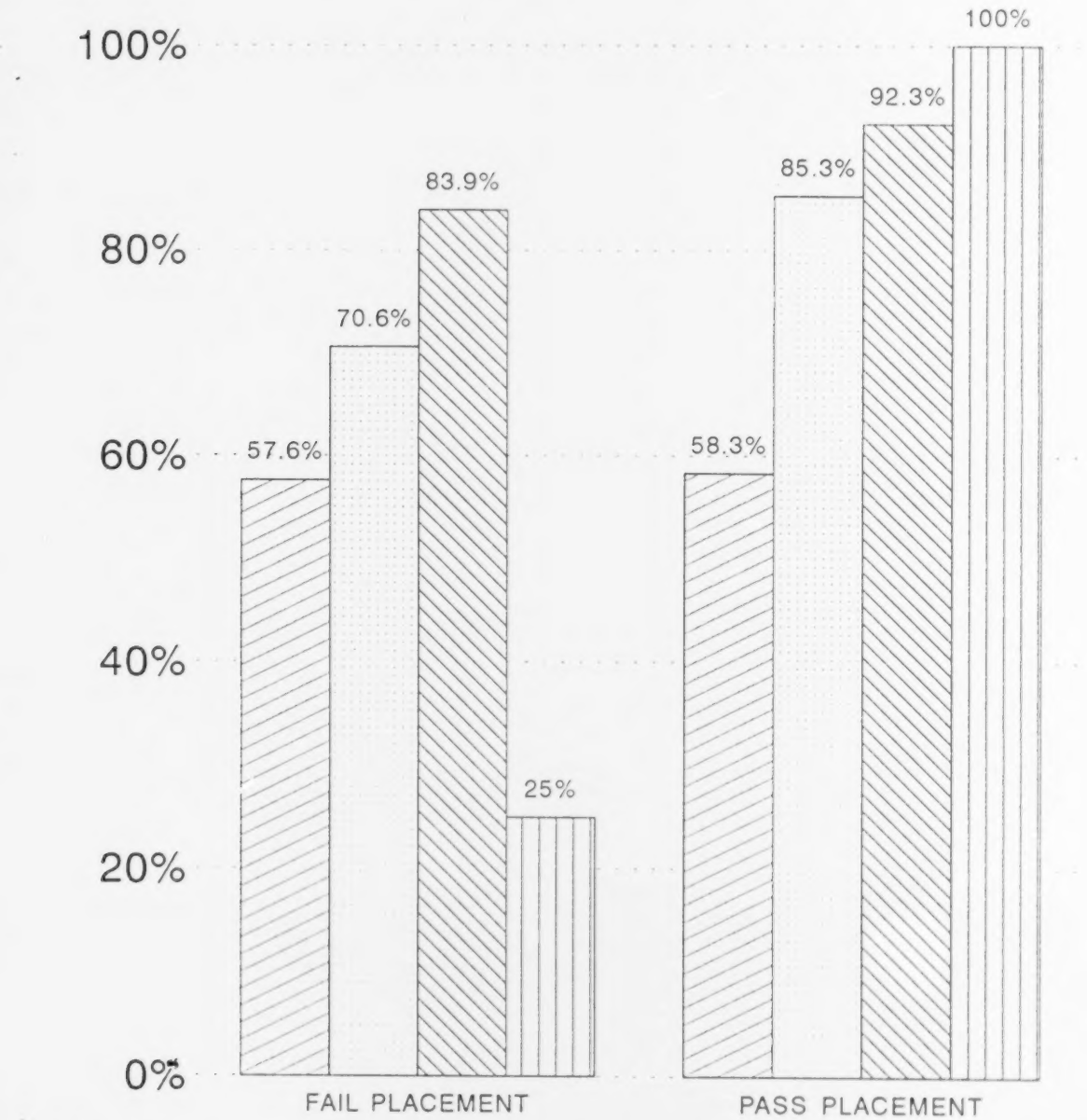
RELATIONSHIP OF PLACEMENT RESULTS IN WRITING AND PERCENTAGES PASSING CLAST WRITING BY RACE



BLACK	33.3%	54.5%
HISPANIC	23.1%	89.5%
WHITE	58.1%	85.9%
OTHER	66.7%	88.9%

Figure 3

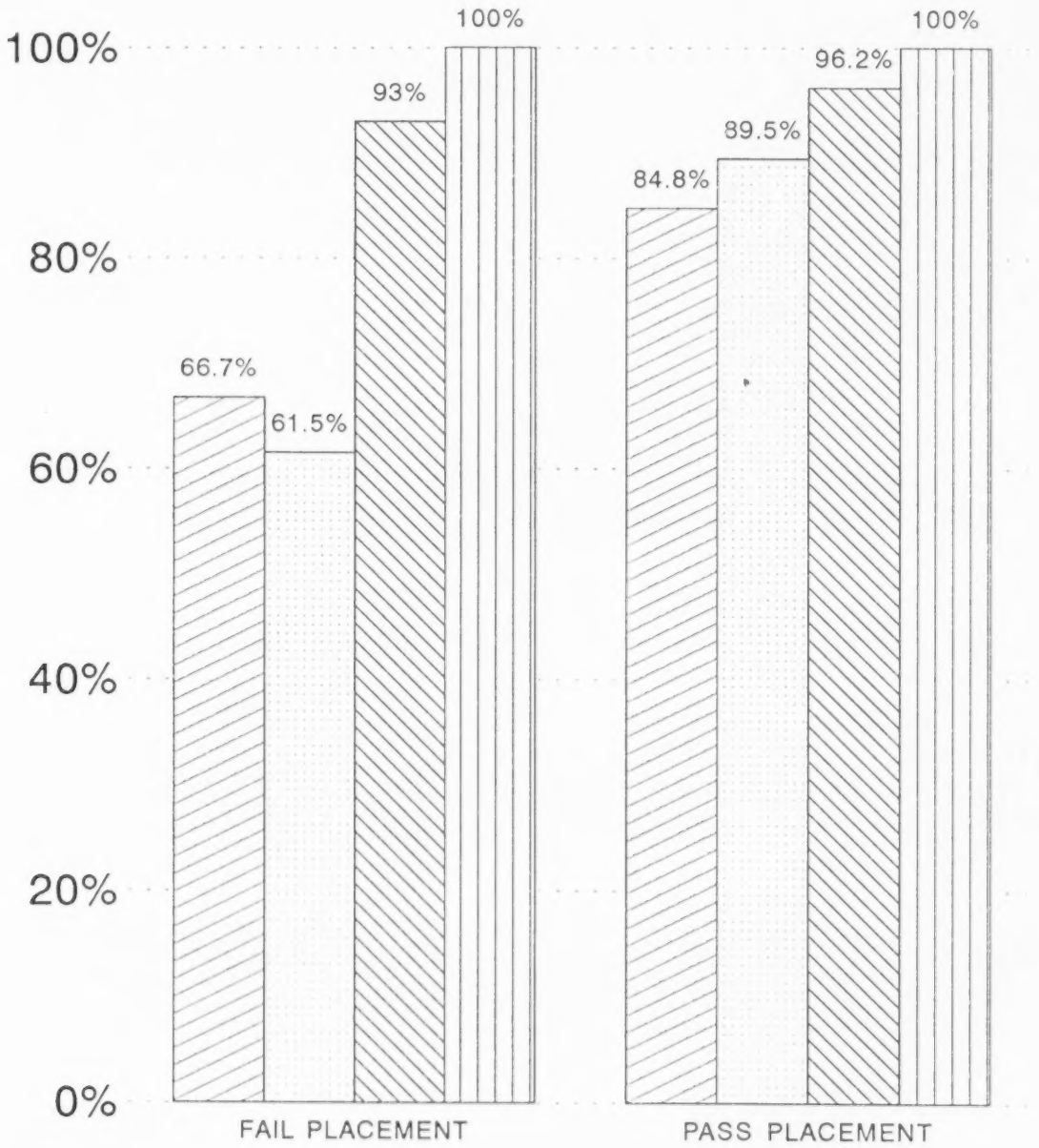
RELATIONSHIP OF PLACEMENT RESULTS IN MATHEMATICS AND PERCENTAGES PASSING CLAST MATHEMATICS BY RACE



BLACK	57.6%	58.3%
HISPANIC	70.6%	85.3%
WHITE	83.9%	92.3%
OTHER	25%	100%

Figure 4

RELATIONSHIP OF PLACEMENT RESULTS IN WRITING AND PERCENTAGES PASSING CLAST ESSAY BY RACE



	FAIL PLACEMENT	PASS PLACEMENT
BLACK	66.7%	84.8%
HISPANIC	61.5%	89.5%
WHITE	93%	96.2%
OTHER	100%	100%

TABLE 8

CLAST Results in Reading Compared to Equivalent ACT Placement Scores in Reading

		CLAST READING % FAIL	% PASS	N	%
ACT EQUIVALENT READING SCORE	6	100.0		3	1.8
	8	100.0		2	1.2
	10	66.7	33.3	3	1.8
	12		100.0	3	1.8
	14	56.3	43.8	16	9.4
	16	25.0	75.0	16	9.4
	18	27.3	72.7	22	12.9
	20	26.7	73.3	15	8.8
	22		100.0	15	8.8
	24	8.0	92.0	25	14.7
	26	4.8	95.2	21	12.4
	28		100.0	19	11.2
	30		100.0	9	5.3
	32		100.0	1	.6
Column Total		33 19.4	137 80.6	170	100.0

Number of Missing Observations: 2

TABLE 9

CLAST Results in Writing Compared to Equivalent ACT Placement Scores in Writing

		CLAST WRITING % FAIL	% PASS	N	%
ACT EQUIVALENT WRITING SCORE	8	50.0	50.0	4	2.6
	10	90.9	9.1	11	7.1
	12	60.0	40.0	5	3.2
	14	28.6	71.4	7	4.5
	16	30.0	70.0	10	6.4
	18	24.0	76.0	25	16.0
	20	9.1	90.9	33	21.2
	22	7.7	92.3	26	16.7
	24	5.9	94.1	17	10.9
	26		100.0	14	9.0
	28		100.0	4	2.6
Column Total		32 20.5	124 79.5	156	100.0

Number of Missing Observations: 16

TABLE 10

CLAST Results in Mathematics Compared to Equivalent ACT Placement Scores in Mathematics

		CLAST MATHEMATICS % FAIL	% PASS	N	%
ACT EQUIVALENT MATHEMATICS	2		100.0	1	.6
	4	100.0		8	5.0
	6	100.0		4	2.5
	8	75.0	25.0	8	5.0
	10	90.0	10.0	10	6.2
	12	40.0	60.0	5	3.1
	14	50.0	50.0	4	2.5
	16	57.1	42.9	7	4.3
	18	27.3	72.7	11	6.8
	20	22.2	77.8	9	5.6
	22	18.2	81.8	11	6.8
	24		100.0	28	17.4
	26		100.0	24	14.9
	28		100.0	19	11.8
	30		100.0	3	1.9
	32		100.0	4	2.5
	34		100.0	3	1.9
	36		100.0	2	1.2
	Column Total	42 26.1	119 73.9	161	100.0

Number of Missing Observations: 11

TABLE 11

CLAST Results in Essay Compared to Equivalent ACT Placement Scores in Writing

	CLAST ESSAY % FAIL	% PASS	N	%
ACT EQUIVALENT WRITING SCORE 8	50.0	50.0	4	2.6
10	18.2	81.8	11	7.1
12	20.0	80.0	5	3.2
14		100.0	7	4.5
16	10.0	90.0	10	6.4
18	8.0	92.0	25	16.0
20	3.0	97.0	33	21.2
22		100.0	26	16.7
24		100.0	17	10.9
26		100.0	14	9.0
28		100.0	4	2.6
Column Total	9 5.8	147 94.2	156	100.0

Number of Missing Observations: 16

Figure 5
RELATIONSHIP OF ACT READING PLACEMENT TEST SCORES TO PASSING CLAST READING

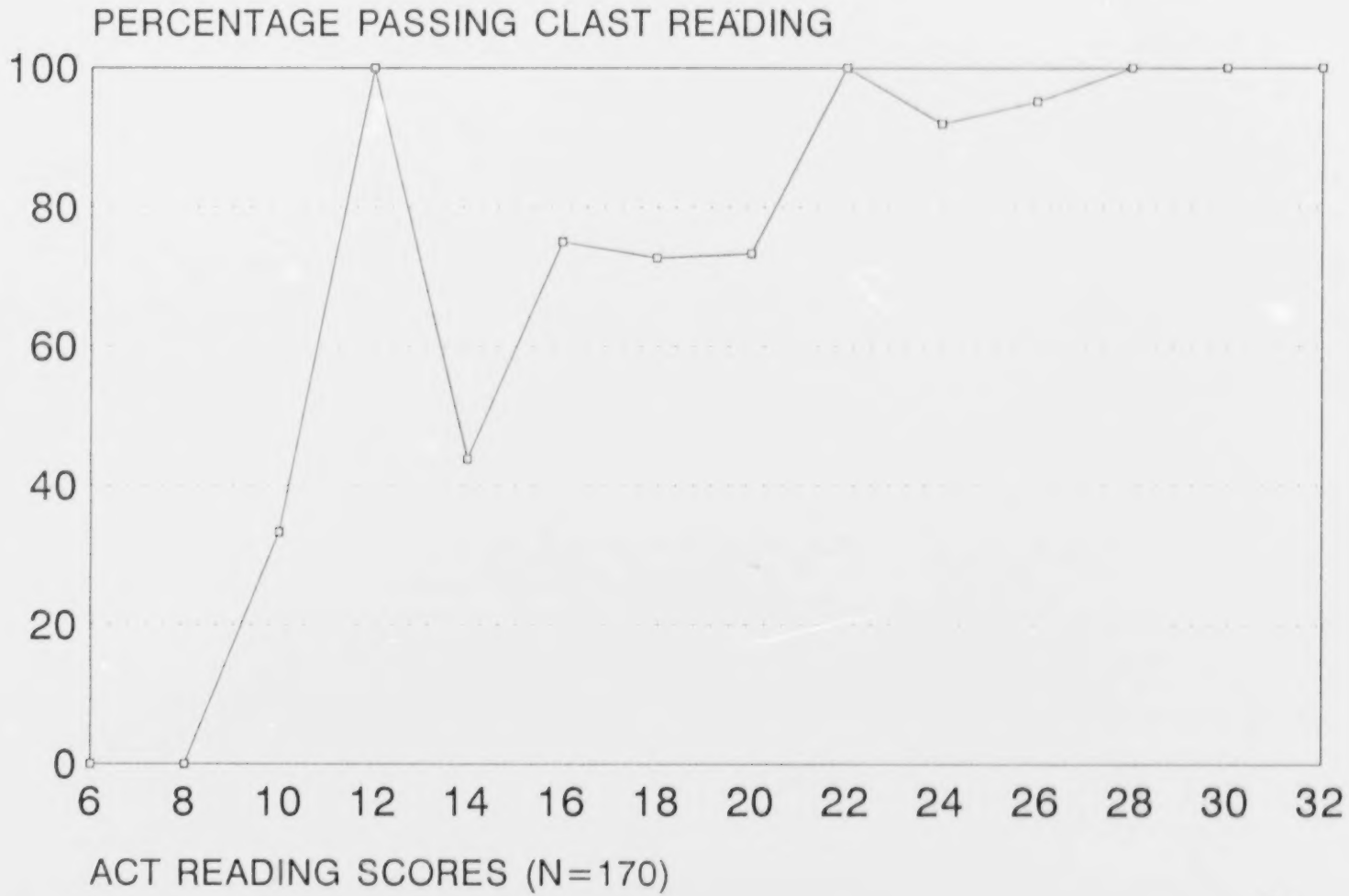


Figure 6
RELATIONSHIP OF ACT WRITING PLACEMENT TEST SCORES TO PASSING CLAST WRITING

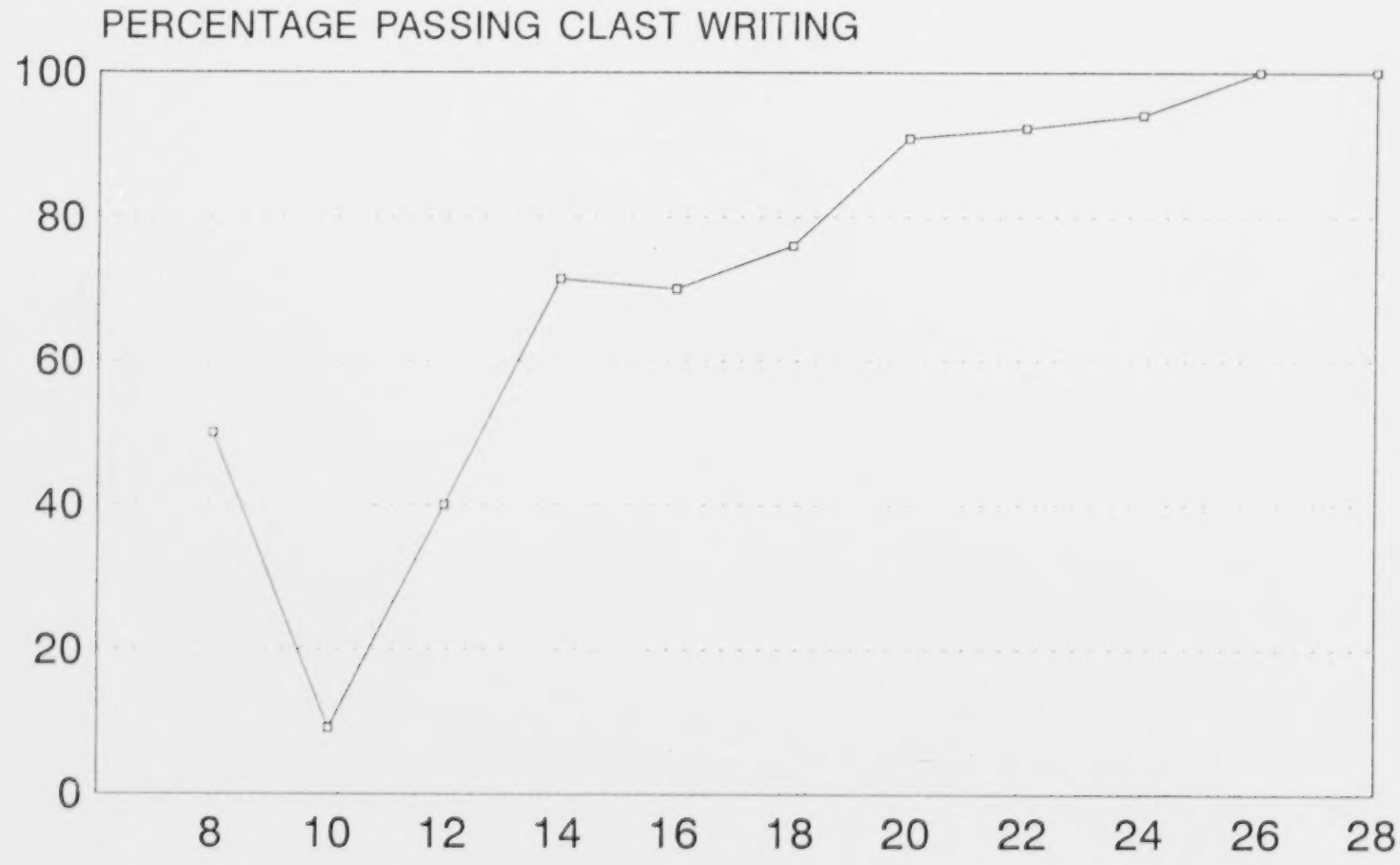


Figure 7
RELATIONSHIP OF ACT MATHEMATICS PLACEMENT TEST SCORES TO PASSING CLAST MATHEMATICS

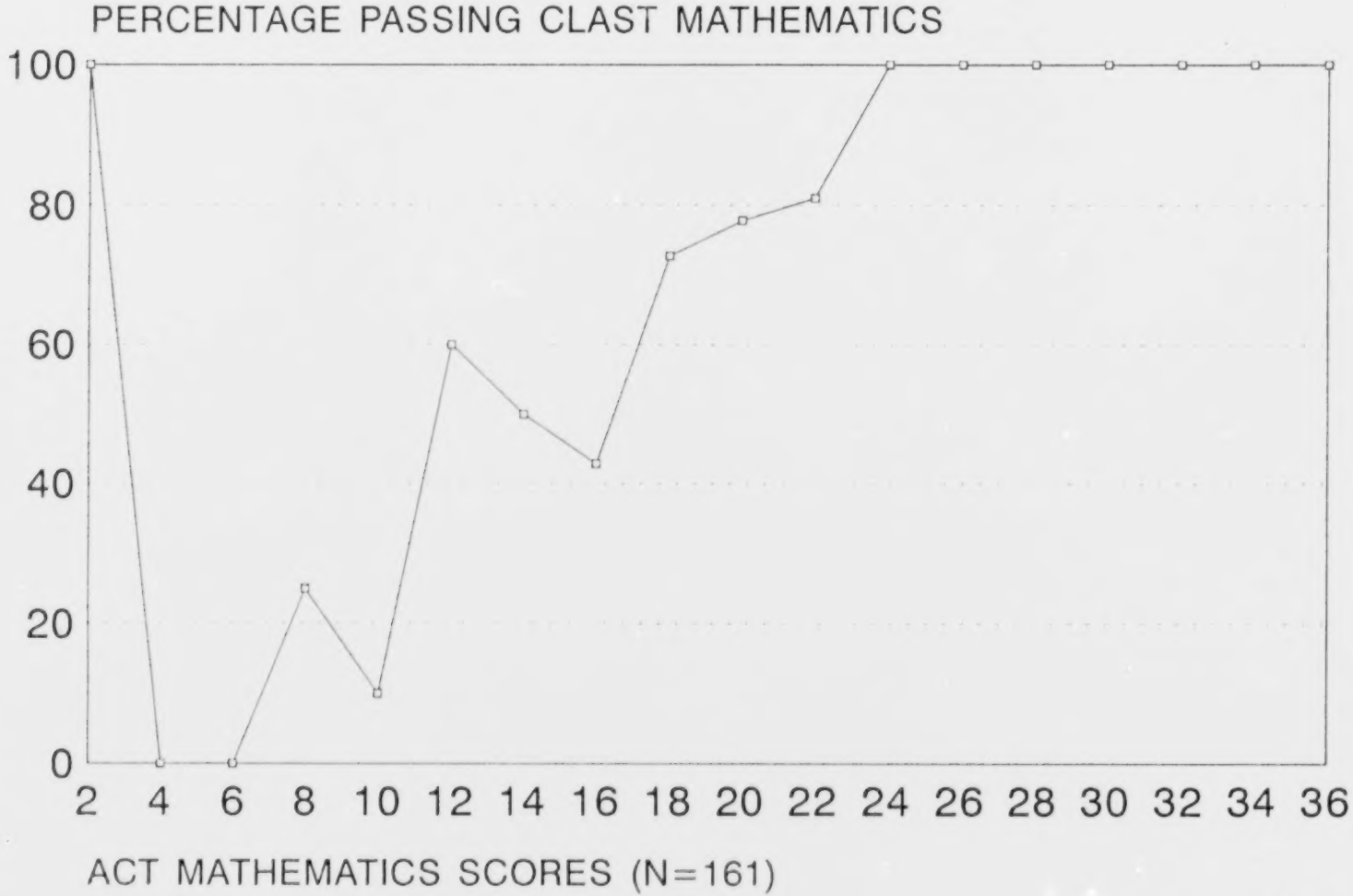


Figure 8
RELATIONSHIP OF ACT WRITING PLACEMENT
TEST SCORES TO PASSING CLAST ESSAY

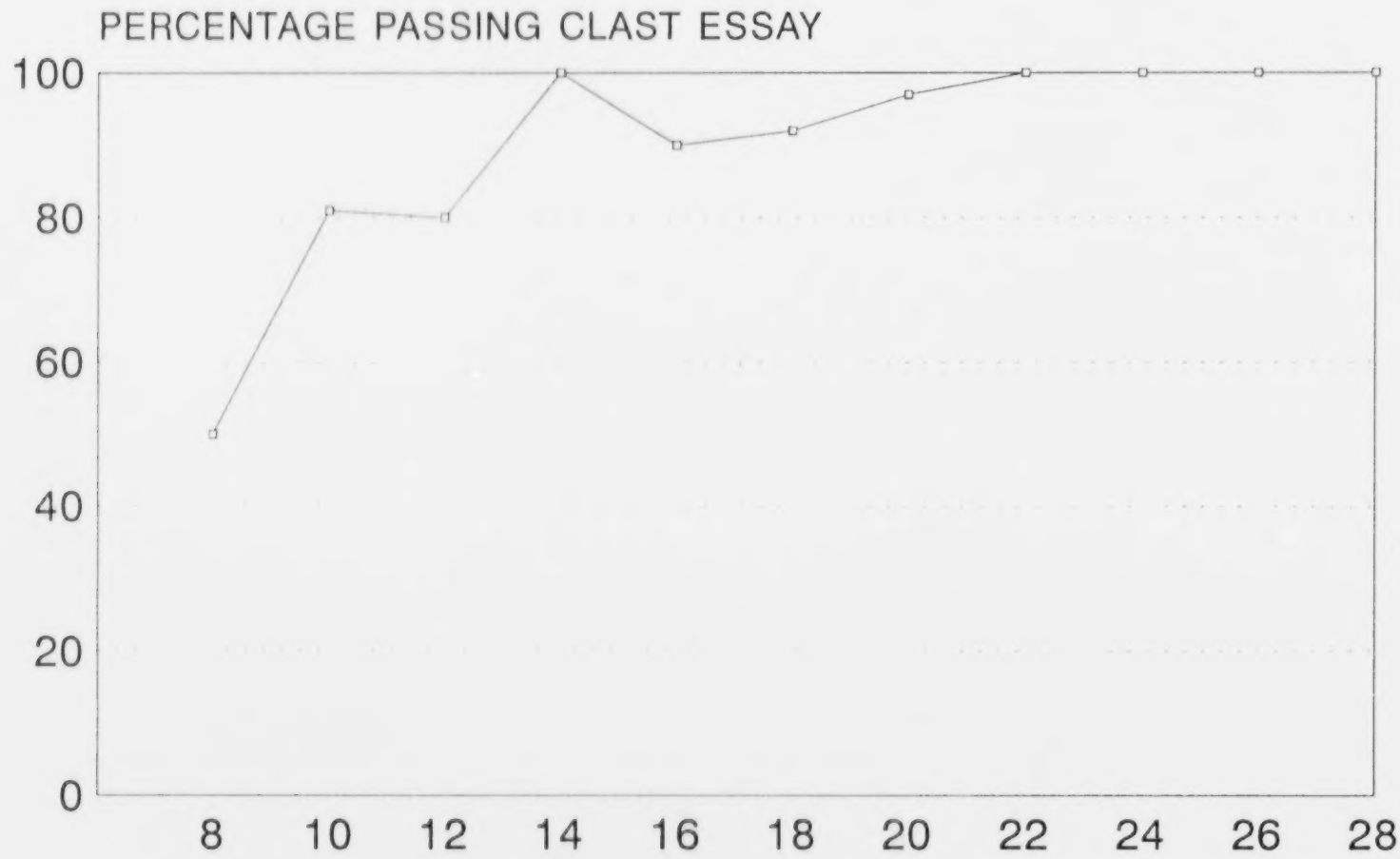


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TABLE 12

Pearson Correlations between CLAST Subtest Scores and Equivalent ACT Placement Scores.

	CLAST			
	READING	WRITING	ESSAY	MATH
ACT READING	.6066 (170) P= .000	.5956 (170) P= .000	.4567 (170) P= .000	.5099 (170) P= .000
ACT WRITING	.5101 (156) P= .000	.6122 (156) P= .000	.4670 (156) P= .000	.4301 (156) P= .000
ACT MATH	.3677 (161) P= .000	.4788 (161) P= .000	.3791 (161) P= .000	.6146 (161) P= .000

(Coefficient / (Cases) / 1-tailed Significance)

TABLE 13

CLAST Reading Results Compared to Number of College-Level Reading Courses Completed

	Count / Row Pct / Col Pct / Tot Pct	CLAST READING FAIL	PASS	Row Total
READING COURSES	0	74	256	330
		22.4	77.6	80.5
		78.7	81.0	
		18.0	62.4	
	1	16	52	68
		23.5	76.5	16.6
		17.0	16.5	
		3.9	12.7	
	2	4	8	12
		33.3	66.7	2.9
		4.3	2.5	
		1.0	2.0	
	Column Total	94	316	410
		22.9	77.1	100.0

TABLE 14

CLAST Writing Results Compared to Number of College-Level English Courses Completed

	Count / Row Pct / Col Pct / Tot Pct	CLAST WRITING FAIL	CLAST WRITING PASS	Row Total
ENGLISH COURSES	0	6 26.1 6.6 1.5	17 73.9 5.3 4.1	23 5.6
	1	12 17.4 13.2 2.9	57 82.6 17.9 13.9	69 16.8
	2	49 19.4 53.8 12.0	203 80.6 63.6 49.5	252 61.5
	3	24 36.4 26.4 5.9	42 63.6 13.2 10.2	66 16.1
	Column Total	91 22.2	319 77.8	410 100.0

TABLE 15

CLAST Mathematics Results Compared to Number of College-Level Mathematics Courses Completed

	Count / Row Pct / Col Pct / Tot Pct	CLAST MATH FAIL	CLAST MATH PASS	Row Total
MATHEMATICS COURSES	0	25 43.1 38.5 6.1	33 56.9 9.5 8.0	58 14.0
	1	19 15.3 29.2 4.6	105 84.7 30.2 25.4	124 30.0
	2	15 12.9 23.1 3.6	101 87.1 29.0 24.5	116 28.1
	3	6 5.2 9.2 1.5	109 94.8 31.3 26.4	115 27.8
	Column Total	65 15.7	348 84.3	413 100.0

TABLE 16

CLAST Essay Results Compared to Number of College-Level English Courses Completed

	Count / Row Pct / Col Pct / Tot Pct	CLAST ESSAY: FAIL	CLAST ESSAY: PASS	Row Total
ENGLISH COURSES	0	3 13.0 9.7 .7	20 87.0 5.2 4.8	23 5.6
	1	4 5.8 12.9 1.0	65 94.2 17.0 15.7	69 16.7
	2	14 5.5 45.2 3.4	240 94.5 62.8 58.1	254 61.5
	3	10 14.9 32.3 2.4	57 85.1 14.9 13.8	67 16.2
	Column Total	31 7.5	382 92.5	413 100.0

Figure 9
PERCENTAGES OF SAMPLE COMPLETING CLAST RELATED COLLEGE-LEVEL COURSES WHO FAILED THE RELATED CLAST SUBTEST

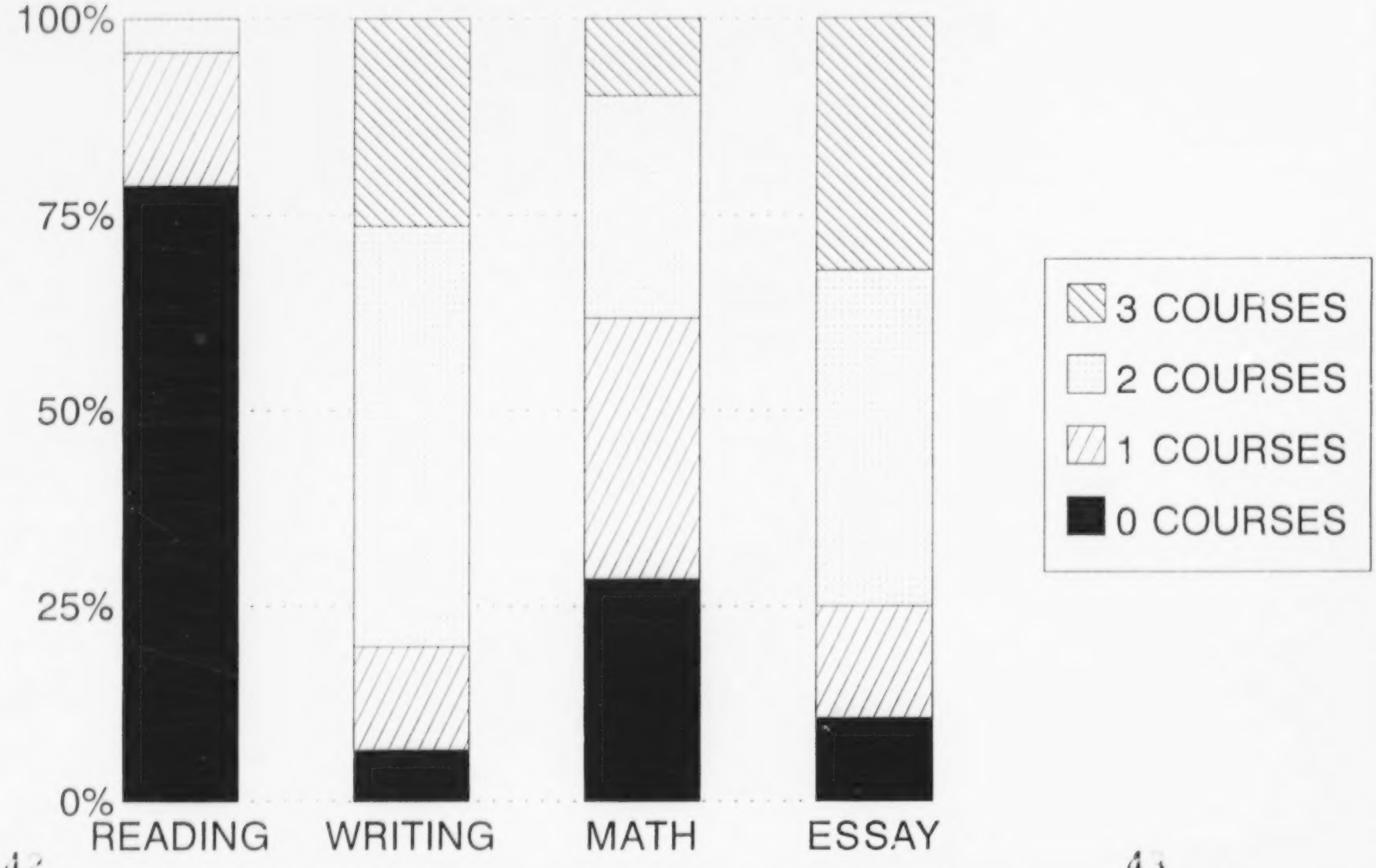

TABLE 17

Developmental Reading Courses Completed and CLAST Reading Results

	Count / Row Pct / Col Pct / Tot Pct	CLAST READING FAIL	CLAST READING PASS	Row Total
DEVELOPMENTAL READING COURSES	0	74 20.1 78.7 18.0	294 79.9 93.0 71.7	368 89.8
	1	18 47.4 19.1 4.4	20 52.6 6.3 4.9	38 9.3
	2	1 33.3 1.1 .2	2 66.7 .6 .5	3 .7
	3	1 100.0 1.1 .2		1 .2
	Column Total	94 22.9	316 77.1	410 100.0

Number of Missing Observations: 0

TABLE 18

Developmental English Courses Completed and CLAST Writing Results

	Count / Row Pct / Col Pct / Tot Pct	CLAST WRITING FAIL	CLAST WRITING PASS	Row Total
DEVELOPMENTAL ENGLISH COURSES	0	66 17.5 72.5 16.1	311 82.5 97.5 75.9	377 92.0
	1	17 73.9 18.7 4.1	6 26.1 1.9 1.5	23 5.6
	2	3 75.0 3.3 .7	1 25.0 .3 .2	4 1.0
	3	3 75.0 3.3 .7	1 25.0 .3 .2	4 1.0
	4	2 100.0 2.2 .5		2 .5
Column Total		91 22.2	319 77.8	410 100.0

Number of Missing Observations: 0

TABLE 19

Developmental Mathematics Courses Completed and CLAST Mathematics Results

	Count / Row Pct / Col Pct / Tot Pct	CLAST MATHEMATICS FAIL	CLAST MATHEMATICS PASS	Row Total
DEVELOPMENTAL MATH COURSES	0	41 11.7 40.2 10.0	308 88.3 100.0 75.1	349 85.1
	1	43 100.0 42.2 10.5		43 10.5
	2	9 100.0 8.8 2.2		9 2.2
	3	8 100.0 7.8 2.0		8 2.0
	4	1 100.0 1.0 .2		1 .2
	Column Total	102 24.9	308 75.1	410 100.0

Number of Missing Observations: 0

TABLE 20

Developmental English Courses Completed and CLAST Essay Results

	Count / Row Pct / Col Pct / Tot Pct	CLAST ESSAY FAIL	CLAST ESSAY PASS	Row Total
DEVELOPMENTAL ENGLISH COURSES	0	16 4.2 57.1 3.9	361 95.8 94.5 88.0	377 92.0
	1	10 43.5 35.7 2.4	13 56.5 3.4 3.2	23 5.6
	2		4 100.0 1.0 1.0	4 1.0
	3	1 25.0 3.6 .2	3 75.0 .8 .7	4 1.0
	4	1 50.0 3.6 .2	1 50.0 .3 .2	2 .5
	Column Total	28 6.8	382 93.2	410 100.0

Number of Missing Observations: 0

Figure 10
PERCENTAGES OF SAMPLE COMPLETING DEVELOPMENTAL COURSES WHO FAILED THE RELATED CLAST SUBTEST

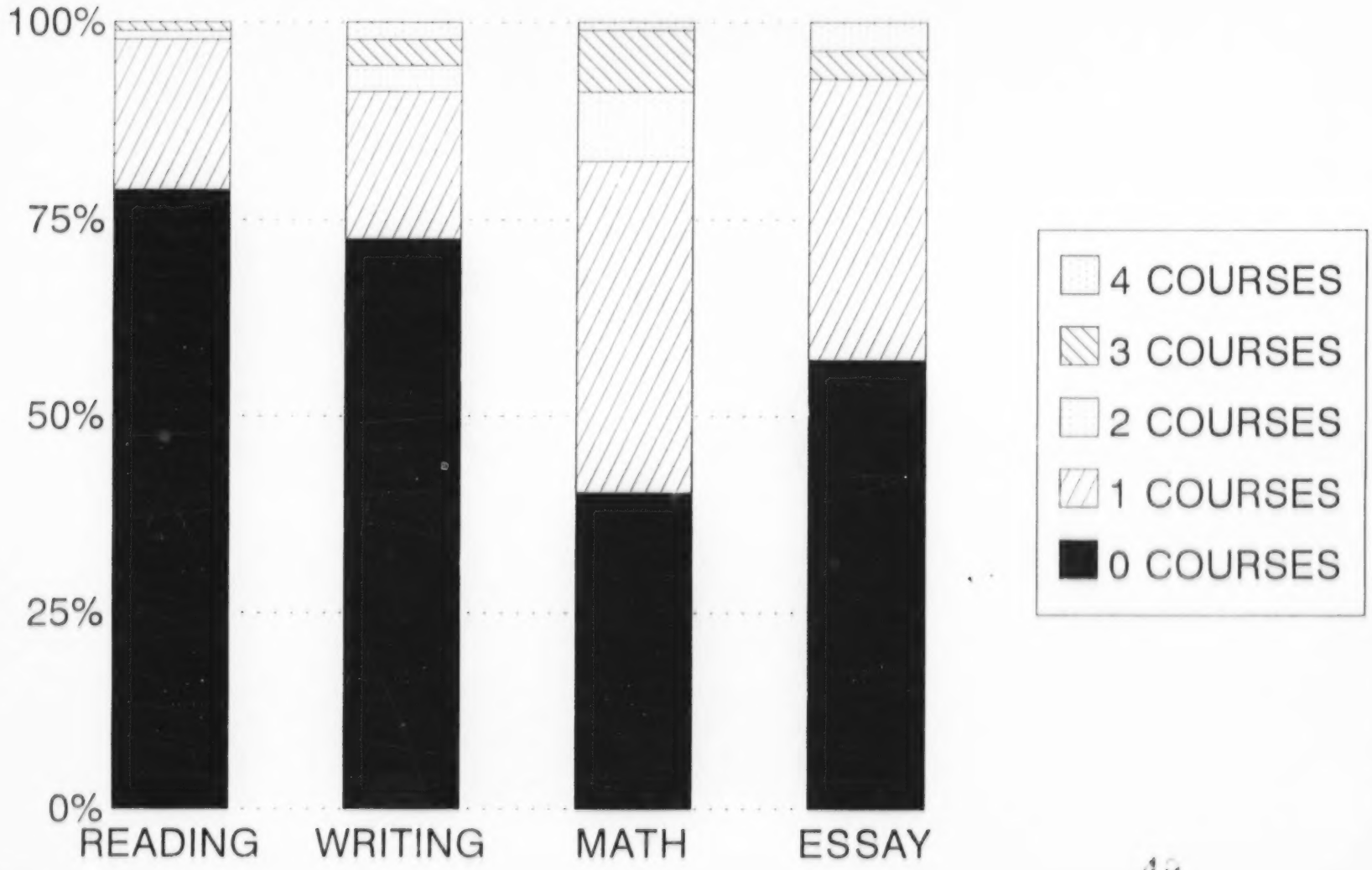

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TABLE 21

CORRELATIONS BETWEEN CLAST SUBTEST SCORES NUMBERS OF COLLEGE-LEVEL COURSES AND COLLEGE-LEVEL GPA IN READING, ENGLISH, AND MATHEMATICS

	CLAST SUBTEST			
	READING	WRITING	ESSAY	MATH
READING COURSES	-.0118 (410) P= .406	-.0349 (410) P= .240	-.0701 (411) P= .078	.0360 (412) P= .233
ENGLISH COURSES	-.1514 (410) P= .001	-.1889 (410) P= .000	-.1169 (411) P= .009	-.2098 (412) P= .000
MATHEMATICS COURSES	.0770 (410) P= .060	.0854 (410) P= .042	.0467 (411) P= .172	.3235 (412) P= .000
READING GPA	.2078 (80) P= .032	.0672 (80) P= .277	.2002 (80) P= .038	.2730 (81) P= .007
ENGLISH GPA	.3155 (387) P= .000	.3601 (387) P= .000	.3089 (388) P= .000	.3050 (389) P= .000
MATHEMATICS GPA	.1898 (352) P= .000	.1626 (352) P= .001	.1031 (353) P= .027	.2608 (354) P= .000

(Coefficient / (Cases) / Significance)

TABLE 22

GPA In College-Level English Courses Compared to CLAST Writing Results

Count / Row Pct / Col Pct / Tot Pct	CLAST WRITING: FAIL	CLAST WRITING: PASS	Row Total
ENGLISH GPA			
LESS THAN 2.0	11 50.0 12.9 2.8	11 50.0 3.6 2.8	22 5.7
2.0	23 37.1 27.1 5.9	39 62.9 12.9 10.1	62 16.0
2.5	17 23.6 20.0 4.4	55 76.4 18.2 14.2	72 18.6
3.0	25 20.5 29.4 6.5	97 79.5 32.1 25.1	122 31.5
3.5	6 9.0 7.1 1.6	61 91.0 20.2 15.8	67 17.3
4.0	3 7.1 3.5 .8	39 92.9 12.9 10.1	42 10.9
Column Total	85 22.0	302 78.0	387 100.0

Number of Missing Observations: 23

TABLE 23

GPA in College-Level English Courses Compared to CLAST Essay Results

Count / Row Pct / Col Pct / Tot Pct	CLAST ESSAY: FAIL	CLAST ESSAY: PASS	Row Total
ENGLISH GPA			
LESS THAN 2.0	6 27.3 24.0 1.6	16 72.7 4.4 4.1	22 5.7
2.0	8 12.9 32.0 2.1	54 87.1 14.9 14.0	62 16.0
2.5	6 8.3 24.0 1.6	66 91.7 18.2 17.1	72 18.6
3.0	4 3.3 16.0 1.0	118 96.7 32.6 30.5	122 31.5
3.5		67 100.0 18.5 17.3	67 17.3
4.0	1 2.4 4.0 .3	41 97.6 11.3 10.6	42 10.9
Column Total	25 6.5	362 93.5	387 100.0

Number of Missing Observations: 23

TABLE 24

GPA In College-Level Mathematics Courses Compared to CLAST Mathematics Results

Count / Row Pct / Col Pct / Tot Pct	CLAST MATHEMATICS FAIL	CLAST MATHEMATICS PASS	Row Total
MATHEMATICS GPA LESS THAN 2.0	15 20.8 20.5 4.3	57 79.2 20.4 16.2	72 20.5
2.0	12 18.8 16.4 3.4	52 81.3 18.6 14.8	64 18.2
2.5	11 22.9 15.1 3.1	37 77.1 13.3 10.5	48 13.6
3.0	22 28.9 30.1 6.3	54 71.1 19.4 15.3	76 21.6
3.5	4 9.5 5.5 1.1	38 90.5 13.6 10.8	42 11.9
4.0	9 18.0 12.3 2.6	41 82.0 14.7 11.6	50 14.2
Column Total	73 20.7	279 79.3	352 100.0

Number of Missing Observations: 58